DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket. No. FWS–R4–ES–2015–0144; 4500030113]

RIN 1018–BA94

Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Elfin-woods Warbler with 4(d) Rule

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine threatened species status under the Endangered Species Act (Act), as amended, for the elfin-woods warbler (*Setophaga angelae*), a bird species in Puerto Rico. This rule will add this species to the List of Endangered and Threatened Wildlife. We are also adopting a rule under the authority of section 4(d) of the Act (a "4(d) rule") that is necessary and advisable to provide for the conservation of the elfin-woods warbler.

DATES: This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF

PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: This final rule is available on the Internet at *http://www.regulations.gov* and *http://www.fws.gov/caribbean*. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at *http://www.regulations.gov*. Comments, materials, and documentation that we considered in this rulemaking will be available by appointment, during normal business hours, at: U.S. Fish and Wildlife Service, Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

FOR FURTHER INFORMATION CONTACT: Marelisa Rivera, Deputy Field Supervisor, U.S. Fish and Wildlife Service, Caribbean Ecological Services Field Office, P.O. Box 491, Road 301 Km. 5.1, Boquerón, PR 00622; telephone 787−851−7297; facsimile 787−851−7440. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Endangered Species Act, a species may warrant protection through listing if it is endangered or threatened throughout all or a significant portion of its range. Listing a species as an endangered or threatened species can only be completed by issuing a rule.

This rule finalizes the listing of the elfin-woods warbler (*Setophaga angelae*) as a threatened species. It includes provisions under the authority of section 4(d) of the Act

that are necessary and advisable for the conservation needs of the elfin-woods warbler.

The basis for our action. Under the Act, we may determine that a species is a threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that this species is currently at risk throughout all of its range due to threats related to habitat modification on private lands under agricultural and other land use requiring vegetation clearance (Factor A) and to other natural or manmade factors, such as restricted distribution and lack of connectivity, genetic drift, hurricanes, and the effects of climate change (Factor E).

Under section 4(d) of the Act, the Secretary of the Interior has discretion to issue such regulations she deems necessary and advisable to provide for the conservation of the species. The Secretary also has the discretion to prohibit by regulation, with respect to a threatened species, any act prohibited by section 9(a)(1) of the Act.

Habitats within some of the physically degraded private lands adjacent to elfin-woods warbler existing populations must be improved before they are suitable for the species; therefore, some activities that would normally be prohibited under 50 CFR 17.31 and 17.32 will contribute to the conservation of the elfin-woods warbler. For the elfin-woods warbler, the Service has determined that species-specific regulations authorized by section 4(d) of the Act are necessary and advisable to provide for the conservation of this species.

Peer review and public comment. We sought comments from independent specialists to ensure that our determination is based on scientifically sound data, assumptions, and analyses. We invited these peer reviewers to comment on the listing proposal. We considered all comments and information we received during the comment period.

Previous Federal Action

Please refer to the proposed listing rule (80 FR 58674, September 30, 2015) for a detailed description of previous Federal actions concerning the elfin-woods warbler.

Summary of Comments and Recommendations

In the proposed rule published on September 30, 2015 (80 FR 58674), we requested that all interested parties submit written comments on the proposal by November 30, 2015. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. On October 3, 2015, we published a newspaper notice in the Primera Hora inviting general public comment. We did not receive any requests for a public hearing.

Peer Reviewer Comments

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinion from six knowledgeable individuals with scientific

expertise that included familiarity with the elfin-woods warbler and its habitat, biological needs, and threats. We received responses from four of the peer reviewers.

We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the listing of elfin-woods warbler. The peer reviewers generally concurred with our methods and conclusions, and provided additional information, clarifications, and suggestions to improve this final rule. Substantive peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

(1) Comment: One peer reviewer stated that the proposed listing rule did not include references to the Puerto Rico Breeding Bird Atlas Project of the Sociedad Ornitológica Puertorriqueña, Inc. (SOPI; *http://www.aosbirds.org/prbba/SpeciesEWWA.html*). The peer reviewer noted there is one record of the elfin-woods warbler being detected during this project on March 31, 2005, in an area between Jayuya and Adjuntas (hexagon 913) in the central mountains of Puerto Rico by Bailey McKay and Richard West. The peer reviewer also indicated that during a Bicknell's thrush study conducted by the Vermont Center for Ecostudies between January and March, 2015, elfin-woods warblers were detected in the Maricao Commonwealth Forest (MCF) and El Yunque National Forest (EYNF), but were not detected in the Carite Commonwealth Forest (CCF) or in the municipalities of Jayuya and Adjuntas.

Our Response: We appreciate these comments. We have added the new information regarding the observation of the elfin-woods warbler between Jayuya and Adjuntas to this final rule. The information available from the website provided by this

reviewer classified this report as a possible observation of the elfin-woods warbler (identified with Code X (seen or heard within safe dates) in the database).

(2) Comment: A peer reviewer provided information about a nest-building activity by the elfin-woods warbler at the MCF recorded on May 5, 2002. The peer reviewer also provided information about the location and description of the nest.

Our Response: We appreciate this information, and have included the new nesting record in this final rule.

(3) Comment: A peer reviewer stated that bird enthusiasts and wildlife photographers may pose a problem to the elfin-woods warbler, as some of them use recordings to attract these birds, probably altering their normal behavior. The peer reviewer indicated this situation appears to be increasing, and the existing regulations do not clearly address this potential harassment.

Our Response: We appreciate this new information. At this time the Service does not have sufficient information to consider this action as a threat to the elfin-woods warbler. However, we will be monitoring the species and will keep track of the effect of these actions. When this final rule is effective (see **DATES**), regulations issued by the Service under the Act and by the Commonwealth of Puerto Rico under its laws will address actions that may result in take of the species.

(4) Comment: One peer reviewer emphasized the need for research on the elfin-woods warbler and its status to inform managers and to facilitate the species' future

delisting. He indicated that automated recording units (ARUs), which automatically record sounds for later computer analyses, suggest tremendous potential for surveying the more inaccessible sites in CCF, Toro Negro, and EYNF.

Our Response: We acknowledge this comment and will develop recovery actions, including research needs, in the recovery plan for the species. The Service concurs with the peer reviewer on the use of ARUs to survey for the elfin-woods warbler in inaccessible sites. We have already initiated a project with academia and local nongovernmental organizations using ARUs to assess the presence of the elfin-woods warbler at the CCF and EYNF.

(5) Comment: One peer reviewer made reference to the description of the elfin-woods warbler included in the proposed listing rule, indicating that adult and sub-adult elfin-woods warbler do not have a stripe above the eyes.

Our Response: We appreciate this information. We described the elfin-woods warbler in the proposed listing rule based on Raffaele 1989 (p. 168). However, considering the expertise of this peer reviewer on the elfin-woods warbler, we included this detailed information and specified that adult and sub-adult elfin-woods warbler do not have a stripe above the eyes.

(6) Comment: One per reviewer indicated that the breeding season of the elfin-woods warbler should be extended to include the entire months of July and August because during these months the family groups stay together as a cohesive unit, which is essential for the survival of fledglings.

Our Response: We concur with this rationale and have made changes to the "Life History" and **4(d) Rule** sections of this final rule to reflect the peer reviewer's input.

(7) Comment: A peer reviewer indicated that disturbances such as shade and coffee tree seasonal pruning and other activities described in the proposed 4(d) rule should be conducted from September 1 through February 28, which is the time period that the peer reviewer suggests is outside the breeding season of the elfin-woods warbler.

Our Response: The proposed 4(d) rule that was published with the proposed listing rule indicated that coffee tree seasonal pruning and other activities would be conducted from July 1 through February 28. However, we concur with the information presented by the peer reviewer, and have made changes to this final rule to reflect the peer reviewer's input.

(8) Comment: One peer reviewer warned about the potential of chemicals used for agriculture (such as pesticides, herbicides, and fertilizers) gaining access to the food chain and eventually to arthropods feeding birds such as the elfin-woods warbler.

Our Response: Under the proposed and this final 4(d) rule, pest control substances (e.g., pesticides, herbicides) and fertilizers will be applied only twice a year during the establishment period of shade and coffee trees (i.e., the first 2 years). The Service believes that during this period, the structure of the agroforestry system is not mature enough to sustain the occurrence of elfin-woods warblers within these areas.

Therefore, we do not expect that the elfin-woods warbler will be negatively affected by these actions.

(9) Comment: A peer reviewer suggested modifying the following sentence in the **Proposed Determination** section: "Current available information indicates that the elfin-woods warbler has a limited distribution, with only two known populations occurring within EYNF and MCF, including the private lands adjacent to MCF, and at least one extirpated population from CCF." The suggested modification is as follows: "Current available information indicates that the elfin-woods warbler has a limited distribution, with only two known populations occurring within EYNF and MCF, including the private lands adjacent to MCF, and at least one possibly extirpated population from CCF."

Our Response: Based on the best available information, the elfin-woods warbler appears to be extirpated from CCF. However, we do not discard the possibility that the species still occurs in this forest. Therefore, we accept the peer reviewer's comment and have modified this rule accordingly.

Federal Agency Comments

Three of the peer reviewers consulted are also from Federal agencies. Only two provided peer review of the proposed rule, and their comments are addressed above under *Peer Reviewer Comments*. One additional Federal agency commented during the open comment period, but did not provide substantive information regarding the proposed listing.

Comments from the Commonwealth of Puerto Rico

(10) Comment: One Commonwealth agency indicated it does not expect any significant impacts on the elfin-woods warbler as a result of the projects it conducts. However, the agency asked to be contacted should additional information on the habitat and location of the species become available in order to prevent potential impacts from future projects.

Our Response: We appreciate these comments. Any new information about the species' distribution and habitat will be available to Commonwealth and Federal agencies via the Service's Environmental Conservation Online System (ECOS) website (*http://ecos.fws.gov/ecp/)* to be considered in future projects. For projects with a Federal nexus, consultations under section 7 of the Act address potential impacts to federally listed species.

Public Comments

We received three public comments. While all indicated support for the listing of the elfin-woods warbler as a threatened species, none provided substantive comments requiring the Service's response.

Summary of Changes from the Proposed Rule

Based upon our review of the comments from peer reviewers, other Federal and Commonwealth agencies, and the public, as summarized above, we reevaluated our proposed rule and incorporated the following changes into this final rule.

(1) We modified the information in the species description to specify that adult and sub-adult elfin-woods warbler do not have a stripe above the eyes (see "Species Description and Taxonomy," below).

(2) We added information regarding the report of the elfin-woods warbler between the municipalities of Adjuntas and Jayuya as part of the species' range (see "Historical and Current Distribution," below).

(3) We modified the information regarding the breeding season of the elfin-woods warbler to include the entire months of July and August (see "Life History," below).

(4) We modified the provisions of the 4(d) rule to set forth that coffee tree seasonal pruning and other activities must be conducted from September 1 to February 28 (see **4(d) Rule**, below).

(5) We added information regarding an additional elfin-woods warbler's nest-building activity at the Maricao Commonwealth Forest (see "Life History," below).

Background

Species Information

Species Description and Taxonomy

The elfin-woods warbler was originally classified under the genus *Dendroica*, but is now recognized as *Setophaga* (Lovette *et al*. 2010, p. 765). Angela and Cameron

Kepler discovered the species in 1971, in the Dwarf forest type at El Yunque National Forest (EYNF) (Kepler and Parkes 1972, p. 3−5). The bird is about 12.5 centimeters (cm) (5 inches (in)) in length (Raffaele 1998, p. 406). The adult's upper body is predominantly black and white, with conspicuous white patches on the ear coverts and sides of the neck (Raffaele 1989, p. 168; Delannoy 2015, pers. comm.). The elfin-woods warbler is often mistaken for the black and white warbler (*Mniotilta varia*), but the elfin-woods warbler is distinguished by its incomplete white eye-ring and entirely black crown. Immature elfin-woods warblers are similar to adults, except that they are grayish-green on the back, and yellowish-green on the head and underparts (Raffaele 1989, p. 168). The bird's call comprises a series of short, rapidly uttered, unmusical notes in one pitch, increasing in volume and ending with a short series of distinct double notes (Curson *et al*. 1994, p. 156).

Life History

Little detailed information has been published on the life history of the elfin-woods warbler. Some authors noted that the elfin-woods warbler is an extremely active warbler, moving among the dense vines of forest strata with more foliage cover or smaller branch tips, foraging insects, usually at intermediate foliage heights of 3 to 15 meters (m) (10 to 50 feet (ft)) (Colón-Merced 2013, p. 2). Opportunistic observations indicate the elfin-woods warbler feeds on moths, dragonflies, and other types of insects; however, its specific diet remains unknown (Colón-Merced 2013, p. 2). Raffaele *et al*. (1998, p. 406) indicated that the breeding season of the species occurs from March to June. However, Delannoy (2015, pers. comm.) stated that based on available

information (i.e., Delannoy 2009), the breeding season of the elfin-woods warbler should include the entire months of July and August because family groups stay together as a cohesive unit during May, June, July, and August. Delannoy (2009, p. 1) reported that four pairs of elfin-woods warblers banded between 2004 and 2008 remained together in their territories in the Maricao Commonwealth Forest (MCF), suggesting that the species is monogamous. In addition, he reported that the elfin-woods warbler maintained territorial defense throughout the year and documented that calling activity increases from January to April and declines considerably during the time pairs are incubating eggs or brooding nestlings.

Arroyo-Vázquez (1992, p. 363) reported the first detailed observation of two nests found in March and April of 1990 in aerial leaf litter at heights between 1.3 to 7.6 m (4.3 to 25 ft) and documented a clutch size of two to three eggs. Also, he observed that the pair's cup nest was woven from rootlets and fibers obtained from tree ferns and lined with grass leaves and down feathers. Raffaele *et al*. (1998, p. 406) further described the nest of the elfin-woods warbler as a compact cup, usually close to the trunk and well-hidden among epiphytes of a small tree. Salguero (2015, pers. comm.) indicated that on May 5, 2002, he and Carina Roig recorded a pair of elfin-woods warblers constructing a nest on a fork tip branch of a *Pinus caribaea* (Caribbean pine) about 5.0 m (16.4 ft) above ground at the former camping area near the MCF offices. Rodríguez-Mojica (2004, p. 22) reported the first nesting event inside a rotten tree stump of Palo Colorado (*Cyrilla racemiflora*) 7.0 m (23.3 ft) above ground in an abandoned camping area at the MCF. He described the nest structure as consisting of a tightly

woven cup of fine plant fibers with dry leaves on its outside and noted that cavity-nesting is not common in warblers.

Arroyo-Vázquez (1992, p. 363) and Rodríguez-Mojica (2004, p. 22) suggested that the species selected aerial leaf litter and cavity-nesting sites to avoid predation. Some authors have suggested that elfin-woods warbler nest predators may include the pearly-eyed thrasher (*Margarops fuscatus*), Puerto Rican tanager (*Nesospingus speculiferus*), Puerto Rican screech owls (*Megascops nudipes*), Puerto Rican boa (*Chilabothrus inornatus,* listed as *Epicrates inornatus*), Puerto Rican racer (*Alsophis portoricensis*), and feral cats (*Felis catus*) (Delannoy 2009, p. 2). Other potential predators of immature and adult individuals include the Indian mongoose (*Herpestes auropunctatus*) and black rat (*Rattus rattus*) (Arroyo-Vázquez 1992, p. 364).

Historical and Current Distribution

The elfin-woods warbler is endemic to the island of Puerto Rico and was initially thought to occur only in the Luquillo Mountains at EYNF in eastern Puerto Rico (Kepler and Parks 1972, pp. 5−6; Pérez-Rivera 1979, p. 58). During the early 1970s, the species was reported in the MCF in western Puerto Rico (Pérez-Rivera 1979, p. 58; Cruz and Delannoy 1984, p. 92). In addition, the elfin-woods warbler was reported in the Toro Negro Commonwealth Forest in the Cordillera Central (central mountain range) (Pérez-Rivera 1979, p. 58), and in the area of Guavate in the Carite Commonwealth Forest in east-central Puerto Rico (Pérez-Rivera and Maldonado 1977, p. 134). More recently, Miranda-Castro *et al*. (2000, pp. 119–123) and Anadón-Irizarry (2006, p. 34) conducted elfin-woods warbler surveys in other forests of the Cordillera Central (i.e., Tres

Picachos, Carite, Toro Negro, Susúa, and Guilarte Commonwealth Forests, and Bosque del Pueblo in Adjuntas), but did not detect the species. However, on March 31, 2005, Bailey McKay and Richard West recorded a possible observation of the elfin-woods warbler between the municipalities of Adjuntas and Jayuya while collecting breeding bird data for the Puerto Rico Breeding Bird Atlas Project (Salguero 2015, pers. comm.; SOPI 2005).

Between 2011 and 2013, the Service, in collaboration with the Puerto Rican Ornithological Society, Inc., and BirdLife International, conducted a study using a habitat suitability model and a single-season occupancy modeling approach to assess the current geographic distribution of the elfin-woods warbler. The project included surveys between January and July during the species' breeding season within habitat currently occupied by the species in the MCF and predicted habitat within the Cordillera Central (Anadón-Irizarry 2013, p. 2). The predicted habitat included public and private lands within the municipalities of Jayuya, Ciales, Adjuntas, Ponce, Orocovis, and Juana Díaz. The species was detected only in the MCF and adjacent private lands (Service 2014, p. 12).

The elfin-woods warbler is particularly difficult to survey because of its small size, its constant moving behavior, and the dense vegetation of areas where it is found (Raffaele 1989, p. 168). In fact, Kepler and Parkes (1972, pp. 5−6) attribute the belated discovery of elfin-woods warbler to the above factors and their similarity to the black and white warbler. Even the vocalization of the elfin-woods warbler can be easily mistaken with other species. Although the presence of the elfin-woods warbler in the forests of the Cordillera Central of Puerto Rico cannot be disregarded based on the

previous facts, the available information suggests that the current distribution of the species is now restricted to two populations in (1) EYNF and (2) MCF and adjacent private lands (Anadón-Irizarry 2006, p. 5; Delannoy 2007, p. 4; González 2008, p. 19). The EYNF and the MCF are located about 150 kilometers (km) (93 miles (mi)) from each other (Arendt *et al.* 2013, p. 2). These habitats are considered essential to elfin-woods warbler abundance and are very important for maintaining healthy populations of the species (Delannoy 2007, p. 24), as they are the only currently known areas where the species still occurs. Although there is suitable habitat for the species between these two forests (Colón-Merced 2013, p.51), the probability of dispersal for the species is low because EYNF is isolated from the central mountain range of Puerto Rico. Urban areas around EYNF increased by more than 2,000 percent between 1936 and 1988, and continue to encroach on forested areas today (Thomlinson and Rivera 2000, p. 17). Between 1988 and 1993, urbanization around this forest increased by 31 percent and represented a 5 percent loss in vegetative cover, more than 80 percent of which was dense forest (Thomlinson and Rivera 2000, p. 17).

Habitat

El Yunque National Forest—EYNF is located in the Sierra de Luquillo in eastern Puerto Rico and covers 11,310 hectares (ha) (28,000 acres (ac)) of the island's area (Weaver 2012, p. 1). This forest was proclaimed as a Crown Reserve by Spain in 1876, and as a Forest Reserve by the U.S. Government since 1903. It is considered the oldest forest reserve and largest protected area in Puerto Rico, and is managed by the U.S. Forest Service (USFS). Elevations of this forest range from 100 to 1,075 m (328 to

3,526 ft) and temperatures change with altitude, ranging between 23.5 and 27 degrees Celsius (ºC) (74 to 81 degrees Fahrenheit (ºF)) at the base of the mountain to between 17 and 20 ºC (63 to 68 ºF) on the mountain peaks (García-Martinó *et al*. 1996, p. 414). Mean annual rainfall ranges from approximately 245 cm/year (96 in/year) at lower elevations to approximately 400 cm/year (157 in/year) at higher elevations (Brown *et al*. 1983, p. 11). The EYNF contains five of the six Holdridge Life Zones found in Puerto Rico (Ewel and Whitmore 1973, pp. 32−49). These five zones are the lower montane wet forest, lower montane rain forest, subtropical moist forest, subtropical wet forest, and subtropical rain forest. In 1951, Wadsworth recognized four major forest types at EYNF: Dwarf, Palo Colorado, Tabonuco, and Sierra Palm (Anadón-Irizarry 2006, p. 9).

At EYNF, the elfin-woods warbler was originally discovered in the Dwarf forest (Kepler and Parkes 1972, pp. 3−5). This forest type falls within the lower montane rain forest life zone (Ewel and Whitmore 1973, p. 49) and occupies 368 ha (909 ac) of EYNF (Weaver 2012, p. 5). It is found on exposed peaks with short, stunted vegetation above 900 m (2,952 ft) elevation (Weaver 2012, p. 58). In general, the Dwarf forest is not well populated with birds (Snyder *et al.* 1987, p. 61).

Later, the species was documented at lower elevations in the Palo Colorado, Tabonuco, and Sierra Palm forests (Wiley and Bauer 1985, pp. 12−18). The Palo Colorado forest occurs within the lower montane rain forest life zone, between approximately 600 and 900 m (1,968 and 2,952 ft) (Weaver 2012, p. 1). This forest type covers about 3,441 ha (8,502 ac) of the EYNF (Weaver 2012, p. 5). This forest is mainly composed of fast-growing trees with height not more than 24 m (78 ft) (Lugo 2005, p. 506).

The Tabonuco forest is found between 150 and 600 m (492 and 1,968 ft) elevation, and occupies 5,663 ha (13,993 ac) of the EYNF (Weaver 2012, p. 5). This forest is dominated by the Tabonuco tree (*Dacryodes excelsa*), which grows primarily on the subtropical wet forest life zones (Ewel and Whitmore 1973, p. 32). The understory of this forest is sparsely vegetated, and the canopy is rich in aerial plants (e.g., bromeliads, orchids, vines, and arboreal ferns) (Ewel and Whitmore 1973, p. 32).

The Sierra Palm forest (also known as palm breaks) may reach canopy heights of 15 m (50 ft) with 17 cm (7 in) average diameters at breast height (dbh) and grows mainly on steep slopes at approximately 450 m (1,476 ft) elevation, covering about 1,838 ha (4,541 ac) of the EYNF (Weaver 2012, pp. 5 and 56). The Sierra Palm forest occurs on steep windward slopes and poorly drained riparian areas (Lugo 2005, p. 496). This forest is dominated by the Sierra palm (*Prestoea montana*) and occurs within the subtropical rain forest life zone (Ewel and Whitmore 1973, p. 4).

Maricao Commonwealth Forest and Adjacent Lands—The main population of the elfin-woods warbler in western Puerto Rico occurs within the MCF, located between the municipalities of Maricao, San Germán, Sabana Grande, and Mayagüez (Ricart-Pujals and Padrón-Vélez 2010, p. 1). This forest is currently administered by the Puerto Rico Department of Natural and Environmental Resources (PRDNER) and covers about 4,168 ha (10,543 ac) with elevations ranging between 150 and 875 m (492 and 2,870 ft) above sea level. Annual average temperature is 21.7 ºC (71 ºF), and annual average rainfall is 233 cm/year (92 in/year) (Silander *et al*. 1986, p. 210). Three of the six life zones reported for Puerto Rico occur on the MCF: subtropical moist forest, subtropical

wet forest, and lower montane wet forest (Ricart-Pujals and Padrón-Vélez 2010, p. 8). The habitats where the elfin-woods warbler has been found within the MCF include *Podocarpus* Forest, Exposed Woodland Forest, Timber Plantations, and Dry Slopes Forest.

The *Podocarpus* Forest occupies only 80 ha (197 ac) of the MCF and is located on the slopes and highest peaks (600−900 m (1,968−2,952 ft)) within the lower montane wet forest life zone (Department of Natural Resources (DNR) 1976, p. 185). *Podocarpus* Forest is dominated by *Podocarpus coriaceus* trees and has closed canopies and well-developed understories composed of tree ferns (*Cyathea* spp.), Sierra palms, and vines (Tossas and Delannoy 2001, pp. 47−53; Anadón-Irizarry 2006, p. 53; González 2008, pp. 15−16).

The Exposed Woodland Forest occupies 2,711 ha (6,700 ac) of the MCF and is found in valleys, slopes, and shallow soils with a more or less continuous canopy (González 2008, pp. 15−16). These forest associations are found at elevations ranging from 470 to 800 m (1,542 to 2,624 ft) within the subtropical wet forest life zone (DNR 1976, p. 185).

Timber Plantations occupy approximately 1,111 ha (2,745 ac) of the MCF in elevations ranging from 630 to 840 m (2,066 to 2,755 ft) within the subtropical wet forest and the subtropical moist forest life zones (DNR 1976, p. 185). This habitat—dominated by the María trees (*Calophyllum calaba*), eucalyptus (*Eucalyptus robusta*), and Caribbean pine (*Pinus caribaea*)—was planted in areas that were completely deforested for agriculture (Delannoy 2007, p. 9; González 2008 p. 5).

Dry Slopes Forest occupies approximately 1,367.3 ha (3,377 ac) of the MCF in elevations ranging from 120 to 300 m (394 to 984 ft) within the subtropical moist forest life zone (DNR 1976, p. 185). This habitat is found in shallow and excessively drained serpentine-derived soils dominated by xerophytic vegetation, thin trees, and a low open canopy. This forest type is more common in the southern and southeastern slopes of the MCF (DNR 1976, p. 185).

Outside the MCF, the elfin-woods warbler has been detected within secondary forests and existing shade-grown coffee plantations (González 2008, pp. 15−16). Secondary forests are found at elevations ranging from 130 to 750 m (426 to 2,460 ft), and the shade-grown coffee plantations are found at elevations ranging from 300 to 600 m (984 to 1,968 ft) (Gonzalez 2008, p. 59; Puerto Rico Planning Board 2015). Also, the elfin-woods warbler has been documented at very low densities outside the MCF in pasturelands, Gallery forests, and rural residential areas, but not in sun-grown (unshaded) coffee plantations (González 2008, pp. 15−16). Young secondary forests developed as a result of abandonment of agriculture during the 20th century. These forests are less than 25 years old with an open canopy height of 12 to 15 m (40 to 50 ft) (González 2008, p. 6) and are found within the subtropical moist and subtropical wet forest life zones (DNR 1976, p. 185). Their understories are well-developed and dominated by grasses, vines, and other early-successional species (González 2008, p. 6). Mature secondary forests are over 25 years old and develop on humid to very humid, moderate to steep slopes. They are characterized by their closed canopies, reaching heights of 20 to 30 m (66 to 100 ft), and sparse to abundant understories (González 2008, p. 6). Some of these forests were used in the past for cultivation of shade-grown

coffee and survived untouched because landowners abandoned agriculture activities (Delannoy 2007, p. 10). The shade-grown coffee plantations are covered with tall mature forests dominated mostly by guaba (*Inga vera*) and guaraguao (*Guarea guidonia*) trees. Found on moderate to steep, humid mountain sides, these trees reach heights of 15 to 20 m (50 to 66 ft), and their understories constantly develop without grasses (González 2008, p. 6). Shade-grown coffee plantations are stable agro-ecosystems that provide habitat, nesting, and feeding for many native, endemic, and migratory species. Some of the best examples of this habitat are found in north, northwest, and northeast MCF (Delannoy 2007, p. 10). Studies have shown that biodiversity of plants, insects, reptiles, birds, and some mammals are higher in shade-grown than in sun-grown coffee plantations (Borkhataria *et al*. 2012, p. 165).

Carite Commonwealth Forest—The Carite Commonwealth Forest (CCF) is within the known historical range of the elfin-woods warbler; however, the species was last observed in this forest about 15 years ago (Pérez-Rivera 2014, pers. comm.). The CCF has been managed for conservation by PRDNER since 1975 (DNR 1976, p. 169). This forest covers about 2,709 ha (6,695 ac), and ranges between 620 and 900 m (2,034 and 2,952 ft) in elevation (DNR 1976, p. 169). The CCF contains four forest types: Dwarf, Palo Colorado, Plantations, and Secondary (Silander *et al*. 1986, p. 188). These forest types are similar to the forests utilized by the elfin-woods warbler in EYNF and MCF.

Although the elfin-woods warbler has not been recently observed in this forest (Anadón-Irizarry 2006, p. 54; Anadón-Irizarry 2014, pers. comm.), the habitat suitability model developed for the species (Colón-Merced 2013, p. 51) suggests CCF still provides suitable habitat for the species due to its similarity in elevation, climatic conditions, and vegetation associations with EYNF and MCF. The CCF's similarity to EYNF and MCF suggests that this forest could provide habitat for the expansion of the elfin-woods warbler's current range to maintain the species' historical, geographical, and ecological distribution.

Population Status

El Yunque National Forest—Kepler and Parkes (1972, p. 15) estimated the elfin-woods warbler population at fewer than 300 pairs occurring in 450 ha (1,111 acres) at EYNF. Waide (1995, p. 9) reported an estimated population of 138 pairs in 329 ha (812 ac) in the Dwarf forest at EYNF. According to Anadón-Irizarry (2006, p. 24), the species' mean abundance was highest (0.48 individuals (ind)/point count) in the Palo Colorado forest, slightly lower (0.42 ind/point count) in the Dwarf forest, lowest (0.01 ind/point count) in the Tabonuco forest, and none were recorded in Sierra Palm forest. Arendt *et al.* (2013, p. 8) conducted bird surveys approximately monthly from 1989 to 2006, and reported a decline of the elfin-woods warbler population in EYNF over that period of 17 years. The species showed a significant general decline from 0.2 ind/ha to 0.02 ind/ha in the Dwarf forest, and from 1 ind/ha to 0.2 ind/ha in the Palo Colorado forest (Arendt *et al.* 2013, p. 9).

Maricao Commonwealth Forest and Adjacent Lands—Cruz and Delannoy (1984, p. 92) suggested that the elfin-woods warbler was not uniformly distributed throughout the MCF and that it was found in different habitats within three studied sites. Anadón-Irizarry (2006, p. 27) conducted a survey from 2003 to 2004, in 102.4 ha (253 ac) of MCF and recorded 778 elfin-woods warblers in 18 counts for an average of 0.42 ind/ha/count. González (2008, pp. 23−28) reported the most recent population estimate for the elfin-woods warbler at the MCF and adjacent areas. González (2008, p. 18) estimated 97.67 elfin-woods warbler individuals in an area of 203.2 ha (0.48 ind/ha) within the MCF. In areas adjacent to the MCF, he estimated 43.02 individuals in an area of 374.4 ha (0.11 ind/ha).

Additionally, González (2008, p. 27) reported that the highest densities of elfin-woods warbler recorded per point-count stations in MCF were within the *Podocarpus* Forest (0.88 ind/ha). Moderate densities were recorded in Exposed Woodland (0.53 ind/ha), Timber Plantations (0.38 ind/ha), and Dry Slope Forest (0.06 ind/ha) (González 2008 p. 27). González (2008 p. 27) stated these results are similar to estimates obtained by previous studies in the same type of forests. In lands adjacent to the MCF, the shade-grown coffee plantations exhibited the highest elfin-woods warbler abundance (0.24 ind/ha) (González 2008, p. 24).

Based on the studies mentioned above, in 2010, BirdLife International estimated the overall elfin-woods warbler population in Puerto Rico to be at least 1,800 mature individuals (Arendt *et al.* 2013, p. 2).

Carite Commonwealth Forest—In 1977, Pérez-Rivera and Maldonado (1977, p. 134) reported the species for the first time in the CCF. Two years later, Pérez-Rivera (1979, pp. 5–8) indicated that the species was more common than was expected when discovered. However, he mentioned that because the species appeared to be specialized to certain types of habitats, any kind of habitat disturbance or modification would cause a rapid decline of the species (Pérez-Rivera 1979, p. 58). The species was later recorded by Pérez-Rivera during the 1980s and 1990s in the following areas: Cerro La Santa, Camino El Seis, first recreation area near the forest entrance, private land near Barrio Farallón, and Fincas Las 300 (Delannoy 2007, pp. 22–23). Based on Pérez-Rivera's observations within these areas, the species seemed to be an uncommon and rare in CCF (i.e., 1 or 2 sightings every 10 visits) (Delannoy 2007, pp. 22–23). The species was later detected occasionally by Pérez-Rivera within the same areas until it was last observed by him more than 15 years ago (Pérez-Rivera 2014, pers. comm.).

The surveys conducted by Anadón-Irizarry between 2003 and 2004, and between 2012 and 2013, failed to detect the species within the CCF. The study conducted during the period of 2003–2004 (Anadón-Irizarry 2006, p. 54) included traditional areas previously searched by Pérez-Rivera, and the surveys were conducted along 5.0 km (3.1 mi) of existing trails. The most recent surveys, conducted between 2012 and 2013, avoided the use of existing trails and included nontraditional areas, but they also failed to detect the species (Anadón-Irizarry 2014, pers. comm.). However, during these surveys, the amount of surveyed area within nontraditional habitat was not significant (i.e., 15 survey stations).

Although these studies failed to detect the species, Anadón-Irizarry (2006, p. 54; 2014, pers. comm.) suggested the possibility that the species is still present in isolated pockets of forest that were not searched during the studies (Delannoy 2007, p. 22). The apparent persistent and relatively sedentary behavior of this species to inhabit certain small and isolated pockets of the forest might have led these authors to suggest that it is possible that CCF may harbor undetected elfin-woods warblers (Anadón-Irizarry 2006, p. 54; Delannoy 2007, pp. 22–23; Pérez-Rivera 2014, pers. comm.). Anadón-Irizarry (2006, p. 54), Delannoy (2007, pp. 22–23), and Pérez-Rivera (2014, pers. comm.) have suggested that the species was extirpated from the traditional areas searched by them during the 1980s, 1990s, and between 2003 and 2004 due to habitat modification activities (i.e., transmission antenna development and road development) that occurred in those years. If this is the case, a comprehensive assessment of the status of this population would require extensive searches covering a much larger area into the fragmented landscape of the CCF (Delannoy 2007, pp. 22–23). Therefore, during early 2016 the Service contracted for a survey to include traditional and nontraditional areas within and beyond CCF's boundaries. A total of 60 sites were surveyed between March and April 2016 using ARBIMON portable recorders (Aide and Campos 2016). Surveyed areas also included suitable habitat identified by the habitat suitability model developed by Colón-Merced (2013). None of the 23,944 1-minute recordings analyzed for the presence of the elfin-woods warbler resulted in positive detection, indicating the species is not present in CCF (Aide and Campos 2016).

Summary of Factors Affecting the Species

Section 4 of the Act, and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on:

(A) The present or threatened destruction, modification, or curtailment of its habitat or range;

(B) Overutilization for commercial, recreational, scientific, or educational purposes;

(C) Disease or predation;

(D) The inadequacy of existing regulatory mechanisms; or

(E) Other natural or manmade factors affecting its continued existence.

Listing actions may be warranted based on any of the above threat factors, singly or in combination.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The majority of extant elfin-woods warbler populations are restricted to two disjunct primary habitats in montane forests at EYNF and at MCF and private lands adjacent to MCF. Although the elfin-woods warbler has not been recently observed in CCF, this forest and adjacent lands still contains suitable habitat for the species. The elfin-woods warbler needs suitable forested habitats for essential behaviors such as foraging, breeding, and sheltering (Anadón-Irizarry 2006, pp. 5–8).

In the past, the majority of the forested areas in Puerto Rico—EYNF, MCF, and CCF—were impacted by agricultural practices; extraction of timber for construction and charcoal (Dominguez-Cristobal 2000, pp. 370–373; Dominguez-Cristobal 2008, pp. 100–103); development of infrastructure for utilities and communications; and construction of roads, recreational facilities, and trails, negatively affecting elfin-woods warbler habitat (DNR 1976, p. 169; Waide 1995, p. 17; Delannoy 2007, p. 4; Anadón-Irizarry 2006, p. 28; Pérez-Rivera 2014, pers. comm.). Currently, each agency manages these forests for conservation purposes under its authorities and mandates to promote habitat conservation (see *Factor D. The Inadequacy of Existing Regulatory Mechanisms*, below); habitat modification pressures from agriculture practices and the development of new infrastructure within the forests are currently very low. However, typical forest management of existing disturbed areas (e.g., trail maintenance, road maintenance, transmission antenna maintenance, and recreational facility improvements) and research activities (e.g., species surveys, endangered species reintroductions) still occur within these forests. The maintenance performed on roads, trails, transmission antenna facilities, and recreational facilities is not presently affecting elfin-woods warbler habitat within these forests. When a management or research activity is conducted, both USFS and PRDNER closely coordinate with the Service during design and planning stages. These planning efforts minimize possible adverse effects on the species and its habitat. In contrast, the expansion of existing facilities (i.e., transmission antennas, access roads, access gates, administration buildings, utilities) within the forests is still a possibility and may result in the degradation of suitable habitat of elfin-woods warbler.

Although the threats to the species and its habitat have been minimized within the lands managed and administrated by USFS and PRDNER within EYNF, MCF, and CCF, respectively, the species is still also threatened with habitat destruction, fragmentation, and degradation in 15 percent of its suitable occupied habitat within private lands adjacent to MCF. These private lands are known to be susceptible to habitat modification caused by unsustainable agricultural practices and other land uses requiring vegetation clearance (e.g., deforestation, monoculture of minor fruits, livestock related activities, human-induced fires, residential use, road improvements). Although not known to be currently occupied, the areas outside EYNF and CCF are also vulnerable to these threats because they are not within the protected lands. In the Municipality of Maricao, the Puerto Rico Department of Agriculture (PRDA) has identified 301 properties (8,442 acres) with potential to be developed as agricultural lands for coffee and citrus plantations (Resolución Conjunta del Senado 2014, p. 2). Although the conversion of forested areas to sun-grown coffee plantations is still occurring on private lands adjacent to MCF, the magnitude of this activity is localized and at a lower level than it was in the past. However, PRDA has expressed its intention to increase the acreages of coffee plantations in Puerto Rico to 16,000 acres by 2016 (PRDA 2015, no page number). PRDA's goal is to provide incentives to landowners (i.e., $1,300/acre) for the establishment of new planting areas of sun-grown or partially shaded coffee (i.e., 1,000 coffee trees per acre) (Regulation 6372, p. 3-6; Regulation Governing the Incentives Programs of the Coffee Production Industry in Puerto Rico). Some of these areas, previously used for agriculture, were abandoned and are currently forested. The majority of the sun-grown coffee plantations were converted several

decades ago, resulting in the elimination of native forest, thus reducing the habitat value for wildlife, including the elfin-woods warbler (Delannoy 2007, p. 20). The most recent studies conducted in MCF and adjacent lands (i.e., Delannoy 2007, p. 15; González 2008, p. 59) did not detect elfin-woods warblers in sun-grown coffee plantations on privately owned lands adjacent to the forest. The establishment of a sun-grown coffee plantation requires the deforestation of the area, removing habitat that elfin-woods warblers are or could be using.

The increase of urban development in private lands adjacent to EYNF and CCF has negatively affected elfin-woods warbler suitable habitat around these forests. Gould *et al.* (2007, pp. 29–31) suggested there is an increasing urbanization trend of the limited land area of eastern Puerto Rico where these forests are located. Urban development in this region increased more than 15 percent between 1991 and 2003 (Gould *et al.* 2007, pp. 29–31). Martinuzzi *et al.* (2007, pp. 294–296) reported that almost 52 percent of the island is classified under either "Urban" use (i.e., 16 percent; 142,562 ha) or "Densely Populated Rural" use (i.e., 36 percent; 320,219 ha) classes. The Urban-use class enhances the contiguity between the compact urban areas across the island, and gives an accurate view of how an "urban ring" encircles interior mountainous and protected areas like EYNF and CCF (Martinuzzi *et al.* 2007, p. 294). The Densely Populated Rural-use class surrounds the urban-use areas and represents most of the territory where human developments expand out from the urban centers following secondary routes (Martinuzzi *et al.* 2007, p. 294). Although the most evident land-use changes in the last 25 years have been the intensification of urbanization that surrounds these forests (Helmer 2004,

pp. 33–35, Gould *et al.* 2007, pp. 29–31, Martinuzzi *et al.* 2007, p. 294), it is not known how much of these lands currently contain habitat suitable for the elfin-woods warbler.

Conservation Efforts to Reduce the Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

In 2014, the Service developed a candidate conservation agreement (CCA) with USFS and PRDNER to promote the conservation of the elfin-woods warbler. The purpose of the CCA is to implement measures to conserve, restore, and improve the elfin-woods warbler's habitat and populations within EYNF and MCF (Service 2014, p. 6). The CCA provides that PRDNER and USFS will promote, develop, and implement the best management practices to avoid any potential threat to suitable and occupied elfin-wood warbler habitat and populations. It also provides that both agencies will implement restoration and habitat enhancement efforts within degraded areas of EYNF and MCF. The agencies will also (1) determine the habitat use, movement, and activity patterns of the species; (2) design and establish long-term population monitoring programs; and (3) develop outreach and education programs to improve mechanisms to promote habitat conservation and restoration within private lands adjacent to both forests.

Although the elfin-woods warbler also occurs on privately owned lands adjacent to MCF that are not covered by the CCA, these areas are part of a habitat restoration initiative in southwestern Puerto Rico implemented by the Service since 2010, through the Partners for Fish and Wildlife (PFW) and Coastal (CP) Programs. The PFW and CP are voluntary programs that provide technical and financial assistance to landowners to

implement restoration and conservation practices on their lands for a particular amount of time. These programs promote the restoration of degraded habitat that was likely occupied by the species before the conversion to agricultural lands and that may be restored as suitable elfin-woods warbler habitat in the future. In some cases, occupied suitable habitat for the species is enhanced and protected through cooperative agreements with the private landowners.

Between 2010 and 2014, a total of 522 ha (1,290 acres) of degraded tropical upland forest and 21 km (13 miles) of riparian buffers have been restored and conserved through these programs in collaboration with the Natural Resources Conservation Service (NRCS), Farm Service Agency (FSA), PRDNER, Envirosurvey Inc. (a local nongovernmental organization), and other partners. Although this initiative promotes the restoration and enhancement of degraded habitat adjacent to the MCF and may potentially provide suitable habitat for the elfin-woods warbler, challenges such as limited resources and uncertainty about landowner participation may affect the implementation of management practices that mitigate impacts of agricultural practices.

Summary of Factor A

The elfin-woods warbler's restricted distribution makes it vulnerable to habitat destruction and modification. The majority of extant elfin-woods warbler populations occur on public lands managed for conservation purposes where activities that may affect the species or its habitat are regulated, and measures to minimize or avoid those impacts are being implemented based on management plans or agencies' management mandates. The elfin-woods warbler has been reported on private lands only outside

MCF. Private lands adjacent to EYNF have not been surveyed, and recent surveys conducted within the CCF and adjacent private lands did not detect the elfin-woods warbler (Aide and Campos 2016). Nonetheless, the agricultural activities and development projects on private lands adjacent to EYNF, MCF, and CCF may result in the loss or fragmentation of habitat that may be suitable for the species as has been suggested by some researchers. Therefore, we believe that habitat curtailment or modification is a threat to the elfin-woods warbler.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Based on the available information, overutilization has not been documented as a threat to the elfin-woods warbler.

Factor C. Disease or Predation

Delannoy (2009, p. 2) indicated that the Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*) infrequently preys on the elfin-woods warbler. Other potential elfin-woods warbler nest predators may include the pearly-eyed thrasher, Puerto Rican tanager, Puerto Rican screech owl, Puerto Rican boa, Puerto Rican racer, and feral cat (Delannoy 2009, p. 2). Additionally, Arroyo-Vázquez (1992, p. 364) noted that the Indian mongoose and black rat are potential egg and nestling predators. Nonetheless, we are not aware of any scientific or commercial information that predation of elfin-woods warblers is having an adverse effect on the species, and

therefore we believe that predation is not a threat to the elfin-woods warbler. Similarly, we have no evidence of any disease affecting the species.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

In 1999, the Commonwealth of Puerto Rico approved Law No. 241−1999, known as the New Wildlife Law of Puerto Rico (*Nueva Ley de Vida Silvestre de Puerto Rico*). The purpose of this law is to, among other things, protect, conserve, and enhance both native and migratory wildlife species; declare as property of Puerto Rico all wildlife species within its jurisdiction; issue permits; regulate hunting activities; and regulate exotic species. In 2004, the Commonwealth of Puerto Rico approved the Regulation Governing the Management of Vulnerable and Endangered Species on the Commonwealth of Puerto Rico (Regulation 6766; *Reglamento para Regir el Manejo de las Especies Vulnerables y en Peligro de Extinción en el Estado Libre Asociado de Puerto Rico*). Regulation 6766 prohibits collecting, killing, or harming species listed under Territorial law, as well as possessing, transporting, or selling items derived from listed species, and requires authorization from the PRDNER Secretary for any action that may affect designated critical habitat of listed species under this regulation (Departamento de Recursos Naturales y Ambientales 2004, pp. 9, 18). In 2004, the Commonwealth of Puerto Rico included the elfin-woods warbler in Regulation 6766 as a "vulnerable species" (a species that, although is not listed as endangered or critically endangered, faces a high risk of extinction in a foreseeable future).

In addition to laws that specifically protect the elfin-woods warbler, MCF and CCF are protected under Puerto Rico's Forests Law (Law No. 133−1975; *Ley de*

Bosques de Puerto Rico), as amended in 2000, which prohibits causing damage to and collection of flora and fauna in public forests. Moreover, all Commonwealth forests are designated as Critical Wildlife Areas (CWA) by PRDNER. The CWA designation constitutes a special recognition by this agency with the purpose of providing information to other Commonwealth and Federal agencies about the conservation needs of these areas, and assisting permitting agencies in precluding negative impacts as a result of permit approvals or endorsements (PRDNER 2005, p. 6).

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712) provides protection for the elfin-woods warbler, which is defined as a migratory bird under the MBTA. The MBTA makes it unlawful to pursue; hunt; take; capture; kill; attempt to take, capture, or kill; possess; offer for sale; sell; offer to barter; barter; offer to purchase; purchase; deliver for shipment; ship; export; import; cause to be shipped, exported, or imported; deliver for transportation; transport or cause to be transported; carry or cause to be carried; or receive for shipment, transportation, carriage, or export, any migratory bird, or any part, nest, or egg of such bird, or any product, whether or not manufactured, which consists of, or is comprised in whole or part, of any such bird, or any part, nest, or egg thereof. However, no provisions in the MBTA prevent habitat destruction unless direct mortality or destruction of active nests occurs.

Finally, the elfin-woods warbler co-occurs with other species that are listed under the Act. In the EYNF, the species co-occurs with the Puerto Rican sharp-shinned hawk (*Accipiter striatus venator*), Puerto Rican boa, Puerto Rican broad-winged hawk (*Buteo platypterus brunnescens*), Puerto Rican parrot (*Amazona vittata*), and several federally listed plants: *Styrax portoricensis*, uvillo (*Eugenia haematocarpa*), *Lepanthes*

eltoroensis, chupacallos (*Pleodendron macranthum*), capa rosa (*Callicarpa ampla*), palo colorado (*Ternstroemia luquillensis*), *Ternstroemia subsessilis*, and *Ilex sintenisii*. In the MCF, the species co-occurs with the Puerto Rican sharp-shinned hawk, Puerto Rican boa, and several federally listed plants: *Cranichis ricartii*, *Gesneria pauciflora*, palo de rosa (*Ottoschulzia rhodoxylon*), palo colorado (*Ternstroemia luquillensis*), higuero de sierra (*Crescentia portoricensis*), and *Cordia bellonis*. Because of the occurrence of these federally listed species within the same habitat where the elfin-woods warblers occurs, any Federal action, funding, or permit within these forests or in private lands adjacent to these forests that may affect these listed species requires a section 7 consultation under the Act. Therefore, the elfin-woods warbler may benefit from indirect protection of these listed species (i.e., implementation of habitat restoration practices and habitat protection).

Summary of Factor D

Based on the information currently available to us, the Federal and Commonwealth regulatory mechanisms are being implemented and are functioning as designed. Lack of enforcement of these laws and regulations has not been identified as having a negative impact to the species or exacerbating other negative effects to the species. Therefore, we do not find existing regulations to be inadequate.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Hurricanes and the Effects of Climate Change

The geographic location of islands in the Caribbean Sea makes them prone to hurricane impacts (Wiley and Wunderle 1993, p. 320). In fact, the frequency of hurricane occurrences is higher in the southeastern United States and the Caribbean than other regions of the world (Wiley and Wunderle 1993, p. 320). Hurricanes can have both direct and indirect effects on bird populations, which may determine the characteristics of local avifauna (Wauer and Wunderle 1992, p. 656; Wunderle *et al.* 1992, p. 323). Arendt *et al.* (2013, p. 2) suggested that catastrophic weather events such as hurricanes can negatively affect the elfin-woods warbler due to its restricted distribution and low number of individuals. Some species may cope with hurricane-induced changes by selecting different prey items, while others may switch their foraging behavior and locations (Wauer and Wunderle 1992, p. 657; Wunderle *et al.* 1992, pp. 323–326).

The frequency of hurricane-induced damage equivalent to F3 (severe) on the Fujita scale (Fujita 1971) is at least three times greater in the northeastern quadrant of Puerto Rico, where EYNF and CCF are located, compared to the rest of the island (White *et al*. 2014, p. 30). In contrast, the western side of Puerto Rico, where MCF is located, is subject to different hurricane trajectories and risks than the eastern portion of the island (White *et al.* 2010, p. 16). For example, in 1998, Hurricane Georges struck MCF, which previously had been spared from hurricanes since 1932 (Tossas 2006, p. 81). Hence, studies of the effects of hurricanes on bird populations in Puerto Rico are limited to the northeastern region and little is known about how bird species are affected elsewhere on the island (Tossas 2006, p. 81).

Delannoy (2007, p. 24) suggested that elfin-woods warbler populations at MCF appeared to be stable. However, studies conducted from 1989 to 2006 at EYNF documented a declining trend in the elfin-woods warbler population during the study period (Arendt *et al.* 2013, pp. 8−9). Arendt *et al.* (2013, p. 8) stated that this documented downward population trend could be related to intrinsic causes (e.g., physiological, genetic). Nonetheless, they further suggest that it is more likely that natural habitat conversion and degradation, resulting from cyclonic events, are playing an important role in the species' decline at EYNF. Direct effects of hurricanes on habitat include massive defoliation, snapped and wind-thrown trees, massive tree mortality, and landslides (Lugo 2008, p. 368). For example, Hurricane Hugo (1989) and Hurricane Georges (1998) caused extensive damage in EYNF, which damage may have adversely impacted the elfin-woods warbler's primary habitat (Arendt *et al.* 2013, pp. 8−9). Arroyo (1991, p. 55) noted that the species was not recorded during 1990 from areas it was reported from previously at EYNF. This forest was heavily damaged by Hurricane Hugo, with more than 80 percent of the forest completely defoliated (Boucher 1990, p. 164). In contrast, at the MCF, Arroyo (1991, pp. 55–56) recorded an apparent vertical migration pattern of the species during months of heaviest rains. Moreover, Tossas (2006, p. 84) found that the elfin-woods warbler was one of two species that recovered within a year to pre-hurricane population levels after Hurricane Georges. This finding suggested that warblers abandoned defoliated sites immediately after the hurricane and shifted to protected patches with adequate foraging substrate and prey until the defoliated sites recovered (Tossas 2006, p. 84). Arendt *et al.* (2013, p. 9) indicated that these contrasting findings may be the result of disproportionate damage

caused by storms in the respective forests. Moreover, the landscape at EYNF is different from that of the MCF in that at EYNF there is no continuous forested vegetation beyond the forest boundaries mainly due to conversion of agricultural lands and lowland broadleaf forests to urbanized areas (Lugo *et al.* 2004, p. 29). Therefore, the probability of dispersion to undamaged areas within and outside EYNF could be reduced for the elfin-woods warbler depending on the damages to the vegetation. The lack of suitable habitat around the EYNF also reduces the probability of elfin-woods warbler re-colonization from the MCF, which is 150 km (93 mi) away (Arendt *et al.* 2013, p. 2).

As discussed above, Anadón-Irizarry (2006, p. 54), Delannoy (2007, p. 24), and Anadón-Irizarry (2014, pers. comm.) have suggested the elfin-woods warbler no longer exists within CCF. Pérez-Rivera (2014, pers. comm.) has suggested that the habitat modification caused by Hurricane Hugo and Hurricane Georges at CCF may have had a negative effect on the elfin-woods warbler. However, he acknowledged that before concluding the species was extirpated from the forest due to these climatological events, a formal and extensive survey should be conducted to include nontraditional areas within and outside of CCF (Pérez-Rivera 2014, pers. comm.). He suggested hurricanes might be detrimental to low densities and habitat-specialized species, but at the same time might benefit insectivorous species like the elfin-woods warbler. In 1989, a month after Hurricane Hugo, Pérez-Rivera (1991, pp. 474–475) recorded the Antillean euphonia (*Euphonia musica*) shifting its feeding and foraging behavior in CCF as a result of the habitat disturbance following the hurricane. Some authors (i.e., Wauer and Wunderle 1992, p. 657; Wunderle *et al.* 1992, pp. 323–326) have suggested that the

frequency of hurricanes in the Caribbean may be determining some of the characteristics of the local avifauna, such as the shifting into new habitats due to hurricane-induced changes.

Hurricanes can have positive effects on forest and bird ecology by temporarily increasing forest productivity (Wiley and Wunderle 1993, p. 337), particularly for species with ample distribution (White *et al.* 2014, p. 31). However, the immediate negative effects of these powerful atmospheric events for a species with demographically vulnerable populations, such as the elfin-woods warbler, outweigh the benefits accrued via short-term primary productivity of vegetation (White *et al.* 2014, p. 31). This might explain the declining elfin-woods warbler population trend documented by Arendt *et al.* (2013, pp. 8−9) at EYNF.

Studies predict an increase in hurricane intensity in the Atlantic, with higher wind speeds and greater amounts of precipitation, but a reduction in the overall number of storms (Jennings *et al.* 2014, p. 8). As mentioned above, hurricanes may result in direct negative effects to the species and its habitat.

Based on the above information, it is possible that the elfin-woods warbler could experience local extinction due to these catastrophic weather events. While the species appears to have the ability to temporarily move to undisturbed areas and survive in MCF, such dispersal ability has not been documented at EYNF. Having two geographically separate populations on both ends of Puerto Rico may benefit the elfin-woods warbler since, based on the history of hurricanes striking the island, it is unlikely for both EYNF and MCF to be impacted by the same weather system at once. However, the fact that there are only two known populations left makes the species more

vulnerable to extinction if one is lost due to a catastrophic weather event. It is important to note, however, that there are no specific studies corroborating hurricanes as a main cause of elfin-woods warbler population declines at EYNF and MCF, nor that hurricanes caused the apparent extirpation of the species from CCF.

Regarding climate, general long-term changes have been observed, including changes in amount of precipitation, wind patterns, and extreme weather events (e.g., droughts, heavy precipitation, heat waves, and the intensity of tropical cyclones) (Intergovernmental Panel on Climate Change (IPCC) 2007, p. 30). For example, projected decreases in precipitation in the Caribbean suggest drier wet seasons, and even drier dry seasons (Jennings *et al.* 2014, p. 1).

As previously mentioned, the elfin-woods warbler is currently known only from specific habitat types at EYNF and MCF, which makes the species susceptible to the effects of climate change. It has been stated that higher temperatures, changes in precipitation patterns, and any alteration in cloud cover will affect plant communities and ecosystem processes in EYNF (Lasso and Ackerman 2003, pp. 101−102). In fact, the distribution of tropical forest life zones in the Caribbean is expected to be altered due to both intensified extreme weather events and progressively drier summer months (Wunderle and Arendt 2011, p. 44). At EYNF, such alteration may allow low-elevation Tabonuco forest species to colonize areas currently occupied by Palo Colorado forest (Scatena and Lugo1998, p. 196). Dwarf forests at EYNF also are very sensitive to the effects of climate change because of their occurrence in narrowly defined environmental conditions (Lasso and Ackerman 2003, p. 95). Dwarf forest epiphytes may experience moisture stress due to higher temperatures and less cloud cover with a rising cloud base,

affecting epiphyte growth and flowering (Nadkarni and Solano 2002, p. 584). As previously mentioned, both the Palo Colorado and Dwarf forests have been reported to have the highest elfin-woods warbler mean abundance (Anadón-Irizarry 2006, p. 24). Although the available information predicting changes in habitat due to the effects of climate change pertains to EYNF, similar changes would be expected for the MCF and CCF, which lies within two of the same life zones as EYNF.

As indicated above, such climate changes are likely to alter the structure and distribution of the habitat used by the elfin-woods warbler. According to Arendt *et al.* (2013, p. 9), approximately 50 percent of the Caribbean birds show medium to high vulnerability to the effects of climate change. Based on that information, species that are dependent on specific habitat types, and that have limited distribution or have become restricted in their range, like the elfin-woods warbler, will be most susceptible to the effects of climate change. However, while continued change is expected, the magnitude and rate of that change is unknown in many cases. In tropical and subtropical forests, significant knowledge gaps exist in predicting the response of natural systems to the effects of climate change, and uncertainties exist with studies forecasting trends in climate (Jennings *et al.* 2014, p. 33). Moreover, regionally downscaled climate models projecting temperature and precipitation patterns at fine scales are not readily available for locations within the Caribbean region, including Puerto Rico (Jennings *et al.* 2014, p. 33). While existing large-scale global climate models are useful in determining potential future trends (Angeles *et al.* 2007, p. 556), the lack of fine-scale data in Puerto Rico's mountainous regions is especially troublesome, as variations in climate with

elevation over short horizontal distances cannot be captured by existing climate models, especially in predictions of extreme events (Meehl *et al.* 2007, p. 477).

Human-induced Fires

Fires are not part of the natural processes for subtropical and moist forests in Puerto Rico (Santiago-Garcia *et al*. 2008, p. 604). In fact, Méndez-Tejeda *et al*. (2015, p. 363) concluded that the majority of forests fires in Puerto Rico are produced by human actions. However, as annual rainfall decreases over time in the Caribbean region, longer periods of drought are expected in the future (Breshears *et al*. 2005, pp. 146–147; Larsen 2000, pp. 510–512). In 2000, Flannigan *et al.* (2000, pp. 225–226) projected an increase of the global fire occurrence over the next century due to the effects of climate change. In Puerto Rico, historical evidence suggests fire frequency is increasing (Burney *et al.* 1994, p. 277; Robbins *et al.* 2008, pp. 530–531). Moreover, the interactions between climate warming and drying, and increased human development, are considered to have the potential to increase the effects of fires (Robbins *et al.* 2008, pp. 530–531).

In EYNF, CCF, and adjacent lands, fires are not considered common. The tropical rain and moist forest conditions of EYNF and CCF (i.e., average annual rainfall of 304.8 cm (120 in) or more) and the very high humidity during most of the year are not conditions conducive to fires as they are in the dry, temperate climates encountered in other regions. The last fire incident in EYNF, recorded in 1994, was categorized as a "minimal fire" that was quickly controlled by USFS staff (USFS 2015, no page number). In the CCF area, fires are considered human-induced and occur in a low

frequency along the road PR-184 (Monsegur 2015, pers. comm.). Although the road-side fires are considered minimal, they have the potential to extend to forested lands within CCF and adjacent private lands affecting suitable elfin-woods warbler habitat.

In the Maricao area (i.e., Municipalities of Sabana Grande and San Germán), fires occur more frequently on the southern dry slopes of MCF and adjacent private lands, particularly during the dry season (Avila 2014, pers. comm.). Human-induced fires modify the landscape and ecological conditions of the habitat by promoting growth of nonnative trees and grasses (Brandeis and Woodall 2008, p. 557). These landscape modifications may reduce the quality and quantity of potential elfin-woods warbler habitat. Moreover, these fires alter the habitat, decreasing the ability of the species to disperse to other forested habitats. Although the primary habitat for the species in MCF (i.e., *Podocarpus* forest) (González 2008, pp. 20−21) is not prone to fire disturbance because it is located on the highest peaks within the lower montane wet forest life zone, suitable habitat at lower elevations might be in danger if these fires extend to forested lands within the forest or private lands. Severe fires in moist tropical forests have the potential to alter microclimates, allowing atypical forest species to invade, increasing the chance of recurrent fires (Sherman *et al.* 2008, p. 536).

Conservation Efforts to Reduce Other Natural or Manmade Factors Affecting the Continued Existence of the Species

As discussed under Factor A above, the Service, USFS, and PRDNER signed a CCA in 2014, to implement strategic conservation actions. In the context of Factor E, these actions include the development and implementation of programmatic

reforestation and habitat enhancement efforts within areas degraded by hurricanes to improve the recovery of the elfin-woods warbler within EYNF and MCF (Service 2014, pp. 18−19). Additionally, the CCA will help develop and design studies to gather information on the elfin-woods warbler (e.g., habitat needs, habitat use, movement and activity patterns, responses to biotic and abiotic factors, and genetic variation) in order to better design and implement conservation strategies for the recovery of the species.

Summary of Factor E

Based on the information available and limited distribution of the elfin-woods warbler, we believe that this species is currently threatened by natural or manmade factors such as hurricanes and human-induced fire. The effects of climate change may exacerbate these threats by increasing intensity and frequency of hurricanes and environmental effects, although information is lacking on the specific extent of these effects. Thus, we consider these other natural and manmade factors to be threats to this species.

Determination

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to elfin-woods warbler. Current available information indicates that the elfin-woods warbler has a limited distribution, with only two known populations occurring within EYNF and MCF, including the private lands adjacent to MCF, and at least one possibly extirpated population from CCF. As discussed in the **Summary of Factors Affecting the Species** section of this

rule, threats to the elfin-woods warbler include loss, fragmentation, and degradation of habitat on private lands adjacent to MCF (Factor A). Some of these lands are subjected to habitat modification caused by unsustainable agricultural practices (i.e., sun-grown coffee plantations), small residential development, and livestock related activities. Moreover, the increase of urban development on private lands adjacent to EYNF and CCF has also negatively affected suitable elfin-woods warbler habitat around these forests. The activities result in the elimination of native forest, thus reducing the suitable habitat available and the habitat value for the elfin-woods warbler.

Other natural or manmade factors (i.e., hurricanes, the effects of climate change, human-induced fires; Factor E) also have been identified as threats to the species. There are only two known remaining populations making the species more vulnerable to extinction if one population is lost due to a catastrophic weather event. The effects of climate change also are expected to alter the structure and distribution of the habitat used by the elfin-woods warbler, which may be particularly susceptible because of the limited distribution and specific forest types used by the species. Human-induced fires have been reported in the Maricao area mostly within the lower southern slopes of the MCF and adjacent private lands, particularly during the dry season, and occasionally in the CCF area. Habitat disturbance caused by human-induced fires may also affect the ability of the species to disperse to other forested habitats.

The Act defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species "that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future." We find that the elfin-woods warbler is not

presently in danger of extinction throughout its entire range based on the low to moderate severity and non-immediacy of threats currently impacting the species. The available information indicates that elfin-woods warbler populations appear to be stable in MCF and that there are no immediate threats precipitating a demographic decline of the elfin-woods warbler in that forest. In Maricao, the species has been reported adjacent to the Commonwealth forest in shade-grown coffee plantations, demonstrating that the species may tolerate some degree of habitat disturbance. At EYNF, the most current information reported a declining trend of the elfin-woods warbler population, mainly attributed to hurricanes striking that forest. However, there are no specific studies corroborating that hurricanes are in fact the main cause of elfin-woods warbler population declines at EYNF and other factors may be influencing the decline (e.g., population low densities and patchy spatial arrangement). Although the species appears to be stable at the MCF, it may be declining at EYNF and extirpated from CCF. The cumulative effects of habitat modification by human actions (e.g., unsustainable agricultural practices) and natural events such as hurricanes would make the two known populations more vulnerable to extinction due to their restricted distribution, limited population numbers, and specific ecological requirements. Therefore, on the basis of the best available scientific and commercial information, we list the elfin-woods warbler as threatened in accordance with sections 3(20) and 4(a)(1) of the Act. We find that an endangered species status is not appropriate for elfin-woods warbler because the species is not currently in imminent danger of extinction throughout all of its range.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self−sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. The plan may be revised to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan identifies site-specific management actions that set a

trigger for review of the five factors that control whether a species remains endangered or may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be made available on our website (*http://www.fws.gov/endangered*), or from our Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Following publication of this final listing rule, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the

Commonwealth of Puerto Rico would be eligible for Federal funds to implement management actions that promote the protection or recovery of the elfin-woods warbler. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7 (a)(1) of the Act directs all Federal agencies to "utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of" endangered and threatened species. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the species' habitat that may require consultation as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the USFS; issuance of section 404 Clean Water Act (33 U.S.C. 1251 et seq.) permits by the U.S. Army Corps of Engineers;

and construction and maintenance of roads or highways by the Federal Highway Administration.

4(d) Rule

Under section 4(d) of the Act, the Service has discretion to issue regulations that we find necessary and advisable to provide for the conservation of threatened wildlife. We may also prohibit by regulation, with respect to threatened wildlife, any action prohibited by section 9(a)(1) of the Act for endangered wildlife. 50 CFR 17.31(a) applies all the general prohibitions for endangered wildlife set forth at 50 CFR 17.21 to threatened wildlife; 50 CFR 17.31(c) states that whenever a 4(d) rule applies to a threatened species, the provisions of §17.31(a) do not apply to that species. Permit provisions for threatened species are set forth at 50 CFR 17.32.

Some activities that would normally be prohibited under 50 CFR 17.31 and 17.32 will contribute to the conservation of the elfin-woods warbler because habitats within some of the physically degraded private lands adjacent to elfin-woods warbler existing populations must be improved before they are suitable for the species. Therefore, for the elfin-woods warbler, the Service has determined that species-specific exceptions authorized under section 4(d) of the Act are necessary and advisable to promote the conservation of this species.

As discussed above in the **Summary of Factors Affecting the Species** section of this listing rule, threats to the species include loss, fragmentation, and degradation of habitat due to unsustainable agricultural practices and land use requiring vegetation clearance. Agricultural practices occurring on private lands adjacent to MCF, especially

those involving habitat modification (e.g., deforestation and conversion of shade-grown coffee to sun-grown coffee plantations), can result in vegetation removal and habitat alteration, thereby degrading habitats used by the elfin-woods warbler for feeding, sheltering, and reproduction.

The private lands surrounding MCF are considered the most active coffee production lands in Puerto Rico. Sun-grown coffee plantations adjacent to MCF were converted several decades ago, resulting in the elimination of native forest overstory, reducing the habitat value for wildlife, including the elfin-woods warbler. Although the majority of the coffee-related agricultural lands were converted to sun-grown coffee plantations, several parcels of land surrounding MCF are currently part of a multi-agency habitat restoration initiative in southwestern Puerto Rico implemented by the Service and NRCS since 2010, through the PFW, CP, and U.S. Department of Agriculture Farm Bill Programs. Activities that improve or restore physical habitat quality, such as the conversion of sun-grown coffee to shade-grown coffee, reforestation with native trees, riparian buffering, and forested habitat enhancement (i.e., exotic species removal, and native tree planting), would have a positive effect on elfin-woods warbler populations and would provide an overall conservation benefit to the species. The NRCS conservation practices promoted under this initiative are the Multi-Story Cropping (Practice 379) and Tree/Shrub Establishment (Practice 612) (USFWS 2011). The Multi-Story Cropping practice promotes the establishment of stands of trees or shrubs that are managed as overstory with an understory of woody and/or non-woody plants that are grown for a variety of products. The purpose of this practice is to improve crop diversity by growing mixed but compatible crops having different heights

in the same area. This will improve soil quality, reduce erosion, enhance degraded areas, and provide habitat for wildlife species such as the elfin-woods warbler. The Tree/Shrub Establishment Practice promotes the establishment of woody plants by planting seedlings or cuttings, direct seeding, or natural regeneration. The purpose is to promote forest products such as timber, wildlife habitat, long-term erosion control, and improvement of water quality, and to improve or restore natural diversity.

Provisions of the 4(d) Rule

Under this 4(d) rule, all of the prohibitions set forth at 50 CFR 17.31 and 17.32 apply to the elfin-woods warbler, except that incidental take caused by the following activities conducted within habitats currently occupied by the elfin-woods warbler on private, Commonwealth, and Federal lands would not be prohibited, provided those activities both abide by the conservation measures in the rule and are conducted in accordance with applicable Commonwealth, Federal, and local laws and regulations:

(1) The conversion of sun-grown coffee to shade-grown coffee plantations by the restoration and maintenance (i.e., removal of invasive, exotic, and feral species; shade and coffee tree seasonal pruning; shade and coffee tree planting and replacement; coffee bean harvest by hands-on methods; and the use of standard pest control methods and fertilizers within the plantations) of shade-grown coffee plantations and native forests associated with this type of crop. To minimize disturbance to the elfin-woods warbler, shade and coffee tree seasonal pruning must be conducted between September 1 and February 28, which is outside the peak of the elfin-woods warbler's breeding season. The Service considers the use of pest control methods (e.g., pesticides,

herbicides) and fertilizers "standard" when it is used only twice a year during the establishment period of shade and coffee trees (i.e., the first 2 years). During this period, the structure of the agroforestry system is not mature enough to sustain the occurrence of elfin-woods warblers within these areas.

Once the shade-grown coffee system reaches its full functionality and structure (i.e., 3 to 4 years), few or no chemical fertilizers, herbicides, or pesticides are required, and their use would be restricted under the 4(d) rule. This is the time period when the shade-grown coffee system is mature enough to support the presence of wildlife species. Researchers have found that the number of species of birds in coffee plantations with structurally and floristically diverse canopies is similar to the number of species in natural forest habitat and is higher than other agricultural landscapes without trees (Perfecto *et al.* 1996, pp. 603-605).

The restoration of agricultural lands due to the planting of native trees to provide shade to coffee trees or by selective removal of exotic species creates physically stable and suitable habitats for the elfin-woods warbler. Moreover, the cultivation of shade-grown coffee has many other ecological and human-health benefits such as the reduction of soil erosion, moderation of soil temperatures, and reduced need for fertilizers and pesticides (Borkhataria *et al*. 2012, p.168). Therefore, restoration, conservation, and protection of shade-grown coffee plantations would provide suitable habitat for the feeding, sheltering, and reproduction activities of this species and may provide habitat to promote the elfin-woods warblers' dispersal and recolonization of lands adjacent to the existing populations.

(2) Riparian buffer establishment through the planting of native vegetation and removal of exotic species may improve the habitat conditions of Gallery forests along the sub-watersheds associated with lands adjacent to the elfin-woods warbler's existing populations. Gallery forests serve as biological corridors that maintain connectivity between forested lands and associated agricultural lands, reducing the fragmentation in the landscape.

(3) Reforestation and forested habitat enhancement projects within secondary forests (i.e., young and mature) that promote the establishment or improvement of habitat conditions for the species by the planting of native trees, selective removal of native and exotic trees, seasonal pruning of native and exotic trees, or a combination of these.

The intent of these exceptions is to provide incentive for landowners to carry out these activities in a manner which we believe will provide benefits to the species such as: (1) Maintaining connectivity of suitable elfin-woods warbler habitats, allowing for dispersal between forested and agricultural lands; (2) minimizing habitat disturbance by conducting certain activities outside the peak of the elfin-woods warbler's breeding season (i.e., pruning between September 1 to February 28); (3) maximizing the amount of habitat that is available for the species; and (4) improving habitat quality. While these activities may cause some temporary disturbance to the elfin-woods warbler or its habitat, we do not expect these activities to adversely affect the species' conservation efforts. In fact, we expect they will have a net beneficial effect on the species.

Based on the rationale above, the provisions included in this rule authorized under section 4(d) of the Act are necessary and advisable to provide for the conservation

of the elfin-woods warbler. Nothing in this 4(d) rule would change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or the ability of the Service to enter into partnerships for the management and protection of the elfin-woods warbler.

We may issue permits to carry out otherwise prohibited activities involving threatened wildlife under certain circumstances. Under regulations governing permits for threatened wildlife species, which are codified at 50 CFR 17.32, a permit may be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, economic hardship, zoological exhibition, educational purposes, and for incidental take in connection with otherwise lawful activities. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act (for this species, those section 9 prohibitions that would be adopted through the 4(d) rule). The intent of this policy is to increase public awareness of the effect of a final listing on proposed and ongoing activities within the range of a listed species. Based on the best available information, the following actions are unlikely to result in a violation of section 9, if these activities are carried out in accordance with existing regulations and permit requirements. This list is not comprehensive:

(1) Activities authorized, funded, or carried out by Federal or Commonwealth agencies (e.g., expansion or construction of communication facilities; expansion of recreational facilities; pipeline construction; bridge construction; road rehabilitation and maintenance; expansion, construction, or maintenance of aqueduct facilities; habitat management; Federal and Commonwealth trust species reintroductions; trail maintenance; camping areas maintenance; research, repair, and restoration of landslides; etc.), when such activities are conducted in accordance with the consultation and planning requirements for listed species under section 7 of the Act; and

(2) Agricultural and silviculture practices implemented within existing agricultural lands (i.e., degraded habitat not suitable for the species) other than sun- to shade-grown coffee conversion and maintenance, including herbicide, pesticide, and fertilizer use outside of coffee plantations, which are carried out in accordance with any Commonwealth and Federal existing regulations, permit and label requirements, and best management practices.

We believe the following activities may potentially result in a violation of section 9 the Act. This list is not comprehensive:

(1) Unauthorized collecting or handling of the species;

(2) Destruction/alteration/fragmentation of habitat essential to fulfilling the lifecycle of the species; and

(3) Introduction of nonnative species that compete with or prey upon the elfin-woods warbler.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Critical Habitat

Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species. Elsewhere in this issue of the **Federal Register** we have published a proposed rule to designate critical habitat for the elfin-woods warbler.

Required Determinations

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act, need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of references cited in this rulemaking is available on the Internet at *http://www.regulations.gov* and upon request from the Caribbean Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this final rule are the staff members of the Caribbean Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361−1407; 1531−1544; and 4201−4245, unless otherwise noted.

2. Amend § 17.11(h) by adding an entry for “Warbler, elfin-woods” to the List of Endangered and Threatened Wildlife in alphabetical order under BIRDS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	**Scientific name**						
* * * * * * *							
BIRDS							
* * * * * * *							
Warbler, elfin-woods	*Setophaga angelae*	U.S.A. (PR)	Entire	T	866	NA	17.41(e)
* * * * * * *							

* * * * *

3. Amend § 17.41 by adding paragraph (e) to read as follows:

§ 17.41 Special rules—birds.

* * * * *

(e) Elfin-woods warbler (*Setophaga angelae*). (1) *Prohibitions*. Except as noted in paragraph (e)(2) of this section, all prohibitions and provisions of 50 CFR 17.31 and 17.32 apply to the elfin-woods warbler.

(2) *Exemptions from prohibitions*. Incidental take of the elfin-woods warbler will not be considered a violation of section 9 of the Act if the take results from any of the following when conducted within habitats currently occupied by the elfin-woods warbler provided these activities abide by the conservation measures set forth in this paragraph (e) and are conducted in accordance with applicable State, Federal, and local laws and regulations:

(i) The conversion of sun-grown coffee to shade-grown coffee plantations by the restoration and maintenance (i.e., removal of invasive, exotic, and feral species; shade and coffee tree seasonal pruning; shade and coffee tree planting and replacement; coffee bean harvest by hands-on methods; and the use of standard pest control methods and fertilizers within the plantations) of shade-grown coffee plantations and native forests associated with this type of crop. To minimize disturbance to the elfin-woods warbler, shade and coffee tree seasonal pruning must be conducted between September 1 and February 28, which is the time period outside the peak of the elfin-woods warbler's breeding season. The Service considers the use of pest control methods (e.g., pesticides, herbicides) and fertilizers "standard" when it is used only twice a year during the

establishment period of shade and coffee trees (i.e., the first 2 years). Once the shade-grown coffee system reaches its functionality and structure (i.e., 3 to 4 years), little or no chemical fertilizers, herbicides, or pesticides may be used.

(ii) Riparian buffer establishment though the planting of native vegetation and selective removal of exotic species.

(iii) Reforestation and forested habitat enhancement projects within secondary forests (i.e., young and mature) that promote the establishment or improvement of habitat conditions for the species by the planting of native trees, selective removal of native and exotic trees, seasonal pruning of native and exotic trees, or a combination of these.

Dated**:** June 6, 2016.

Stephen Guertin,

Acting Director, U.S. Fish and Wildlife Service.

Billing Code 4333–15–P

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